KL

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,634	08/03/2001	Shu-Ya Hsu	4425-177	6069

7590 04/18/2002

LOWE HAUPTMAN GILMAN & BERNER, LLP
Suite 310
1700 Diagonal Road
Alexandria, VA 22314

EXAMINER	
PHAM, LONG	
ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 04/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/920,634	Applicant(s) HSU, SHU-YA	
	Examiner Long Pham	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on ______ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) ______ is/are withdrawn from consideration.

5)☐ Claim(s) ______ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) ______ is/are objected to.

8)☐ Claim(s) ______ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on ______ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on ______ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. ______ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ______ .
4) ☐ Interview Summary (PTO-413) Paper No(s). ______ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 7, line 2, there is no antecedent basis for "hydrogen".

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 3, 4, 5, 6, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) of this application in view Yu (US '911) Munshi et al. (US '443).

AAPA teaches a method for forming a sacrificial oxide layer, said method comprising (see figure 1 and the Description of the Related Art on pages 1 and 2 of this application)):

providing a silicon substrate having isolation regions (shallow trench isolation) therein; and

forming a sacrificial oxide layer over said substrate.

However, AAPA fails to teach forming the sacrificial oxide layer by in situ steam generated process in a chamber having oxygen as recited in present claims 1 and 4.

Yu teaches a method in which oxide layer is formed by in situ steam generated process in a chamber having oxygen (inherent in process of oxidation). See col. 5, lines 25-35.

It would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** form the sacrificial oxide layer by in situ steam generated process in a chamber having oxygen in the method of AAPA because in doing so the thin oxide layer can be formed. See col. 5, lines 25-35.

AAPA and Yu further fail to teach that the chamber has hydroxyl as recited in present claim 1.

Munshi teaches a method in which hydroxyl ions are added during oxidation process. See col. 8, lines 15-25.

It would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** to add hydroxyl in the oxidation process of AAPA and Yu because in doing so higher oxidation state surface oxides can be obtained. See col. 8, lines 15-25.

Yu teaches performing in situ steam generated process at a temperature but fails to teach the range of temperature as recited in present claim 5.

However, it would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** to determine the workable or optimal range for the temperature through routine experimentation and optimization to obtain optimal or desired device performance because the temperature is a

result-effective variable and there is no evidence indicating that the temperature is critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA, Yu, and Munshi fail to teach the flow rates of oxygen and hydroxyl as recited in present claims 6 and 7.

However, it would have been obvious to ***one of ordinary skill in the art of making semiconductor devices*** to determine the workable or optimal ranges for the flow rates for oxygen and hydroxyl through routine experimentation and optimization to obtain optimal or desired device performance because the flow rates for oxygen and hydroxyl is a result-effective variable and there is no evidence indicating that the flow rates for oxygen and hydroxyl is critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA and Yu further fail to teach that the chamber is a single wafer chamber is recited in present claim 8.

However, the use of single wafer chamber is well-known to ***one of ordinary skill in the art of making semiconductor devices***.

3. Claims 9, 10, 11, 12, 13, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) of this application in view Yu (US '911) Munshi et al. (US '443).

AAPA teaches a method for forming a sacrificial oxide layer, said method comprising (see figure 1 and the Description of the Related Art on pages 1 and 2 of this application)):

providing a silicon substrate having isolation regions (shallow trench isolation) therein; and

forming a sacrificial oxide layer over said substrate.

However, AAPA fails to teach forming the sacrificial oxide layer by in situ steam generated process in a chamber having oxygen as recited in present claims 9 and 12.

Yu teaches a method in which oxide layer is formed by in situ steam generated process in a chamber having oxygen (inherent in process of oxidation). See col. 5, lines 25-35.

It would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** form the sacrificial oxide layer by in situ steam generated process in a chamber having oxygen in the method of AAPA because in doing so the thin oxide layer can be formed. See col. 5, lines 25-35.

AAPA and Yu further fail to teach that the chamber has hydroxyl as recited in present claim 9.

Munshi teaches a method in which hydroxyl ions are added during oxidation process. See col. 8, lines 15-25.

It would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** to add hydroxyl in the oxidation process of AAPA and Yu because in doing so higher oxidation state surface oxides can be obtained. See col. 8, lines 15-25.

Yu teaches performing in situ steam generated process at a temperature but fails to teach the range of temperature as recited in present claim 9.

However, it would have been obvious to ***one of ordinary skill in the art of making semiconductor devices*** to determine the workable or optimal range for the temperature through routine experimentation and optimization to obtain optimal or desired device performance because the temperature is a result-effective variable and there is no evidence indicating that the temperature is critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA, Yu, and Munshi fail to teach the flow rates of oxygen and hydroxyl as recited in present claims 13 and 14.

However, it would have been obvious to ***one of ordinary skill in the art of making semiconductor devices*** to determine the workable or optimal ranges for the flow rates for oxygen and hydroxyl through routine experimentation and optimization to obtain optimal or desired device performance because the flow rates for oxygen and hydroxyl is a result-effective variable and there is no evidence indicating that the flow rates for oxygen and hydroxyl is critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA and Yu further fail to teach that the chamber is a single wafer chamber is recited in present claim 15.

However, the use of single wafer chamber is well-known to ***one of ordinary skill in the art of making semiconductor devices***.

4. Claims 16, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) of this application in view Yu (US '911) Munshi et al. (US '443).

AAPA teaches a method for forming a sacrificial oxide layer, said method comprising (see figure 1 and the Description of the Related Art on pages 1 and 2 of this application)):

providing a silicon substrate having isolation regions (shallow trench isolation) therein; and

forming a sacrificial oxide layer over said substrate.

However, AAPA fails to teach forming the sacrificial oxide layer by in situ steam generated process in a chamber having oxygen as recited in present claim 16.

Yu teaches a method in which oxide layer is formed by in situ steam generated process in a chamber having oxygen (inherent in process of oxidation). See col. 5, lines 25-35.

It would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** form the sacrificial oxide layer by in situ steam generated process in a chamber having oxygen in the method of AAPA because in doing so the thin oxide layer can be formed. See col. 5, lines 25-35.

AAPA and Yu further fail to teach that the chamber has hydroxyl as recited in present claim 16.

Munshi teaches a method in which hydroxyl ions are added during oxidation process. See col. 8, lines 15-25.

It would have been obvious to ***one of <u>ordinary skill</u> in the art of making semiconductor devices*** to add hydroxyl in the oxidation process of AAPA and Yu because in doing so higher oxidation state surface oxides can be obtained. See col. 8, lines 15-25.

Yu teaches performing in situ steam generated process at a temperature but fails to teach the range of temperature as recited in present claim 16.

However, it would have been obvious to ***one of ordinary skill in the art of making semiconductor devices*** to determine the workable or optimal range for the temperature through routine experimentation and optimization to obtain optimal or desired device performance because the temperature is a result-effective variable and there is no evidence indicating that the temperature is critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

AAPA, Yu, and Munshi fail to teach the flow rates of oxygen and hydroxyl as recited in present claims 17 and 18.

However, it would have been obvious to ***one of ordinary skill in the art of making semiconductor devices*** to determine the workable or optimal ranges for the flow rates for oxygen and hydroxyl through routine experimentation and optimization to obtain optimal or desired device performance because the flow rates for oxygen and hydroxyl is a result-effective variable and there is no evidence indicating that the flow rates for oxygen and hydroxyl is critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 703-308-1092. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is

assigned are 703-746-4082 for regular communications and 703-746-4082 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

L. Ph

Long Pham
Primary Examiner
Art Unit 2823

L.P.

April 15, 2002